

LIMITED CIRCULATION

This paper is not an official document: it is for information only and must not be quoted in any printed publication.

AGRICULTURAL MEMORANDUM NO 1042

WEATHER IN THE SOUTH-WEST REGION DURING THE 1983/84 GROWING SEASON

by C Hume

SUMMARY

Weather during the 1983/84 growing season is described in terms of weekly temperatures, sunshine, rainfall, soil moisture deficit and accumulated temperature. The effects on cereal growth and grass production are considered. Periods of above average sunshine made a major contribution to the high yields of cereals; weather effects on farm operations were also important.

INTRODUCTION

Cereal yields in 1984 were high throughout the UK - suggesting that weather factors were the cause. This note examines the weather during the growing season.

DATA

The weather over the Region during the period September 1983 to August 1984 has been examined by considering air temperature, sunshine, rainfall, soil moisture deficit and accumulated temperature for a number of sites in the Region.

Measurements of the first three variables have been taken from the Met Office's Weekly Weather Notes in which weekly averages are expressed as deviations from average. Accumulated temperatures (at sea level) are taken from the Office's T-Sum Service. Soil moisture information is derived from MORECS.

It was found that, when expressed as deviations from average, the pattern of air temperature, sunshine and rainfall was similar over the whole Region. Thus, data for only a few sites need be shown; Four sites have been selected - Exeter, Boscombe Down, Cheltenham and St Mawgan (Fig 1).

Figures 2a-2d show, for each of these sites, weekly values of:

air temperature - expressed as a deviation from average

sunshine duration) expressed as a percentage of average
rainfall)

soil moisture deficit - for grass

accumulated temperature - from 1st September 1983 and 1st January 1984

DISCUSSION

Various features of the weather sequence and their relevance to cereal and grass growth are described below.

(a) **September to mid-October**

Enough rain to moisten the upper layers of the soil but not enough to delay fieldwork (including subsoiling; the summer had also been good for such work which was needed in many places following the wet Spring). Cereal seedbeds were well made; soil temperatures (not shown) were above normal; cereals germinated rapidly and emerged evenly.

Rain during the period also stimulated grass growth and provided grazing and conservation opportunities to offset the effects of the dry Summer. Reseeds (necessary in places after the wet Spring) also benefited.

(b) **Mid-October to end November**

A dry period that encouraged rooting in the cereals. Soil conditions allowed good utilisation of grazing.

(c) **End November to mid-December**

Return to field capacity was about two months later than normal. Soil conditions allowed spraying when required and weed control was good.

The risk of poaching increased at the end of the period but sufficient grazing and late silage making had improved the winter fodder situation.

(d) **Mid-December to end March**

Winter was drier than usual; the excess winter rain was about 190 mm which is about the lower quartile value. Hence less waterlogging, less leaching and further incentive to deeper rooting.

(e) **Mid-December/late January to late March**

The ear development stage. From the middle of the period, temperatures were mainly below normal - causing slow development, which seems to be good for ensuring a high number of potential grain sites. There was most benefit to the later sown cereals since those sown earlier may have completed the stage before the start of the cool period.

Application of slurry, FYM and nitrogen began in early February but grass growth was slow (due to low temperatures).

(f) **Mid-February to mid-April**

Dry spells helped spraying, top dressing and seedbed preparation.

Soil temperatures (not shown) were above normal (by about 1°C). Cool, dry weather slowed development of fungal diseases.

(g) **Late March to late May**

The stem extension stage (of winter cereals).

Temperatures cooler than normal caused slow development and allowed more time for photosynthesis. Therefore dry matter accumulation in both stem and ear was increased; the dry matter in the stem might have been used later during grain filling. This was helped by above average sunshine, which might also have reduced the amount of tiller death in the winter crop.

Soils began to dry around 3 or 4 weeks earlier than usual which again encouraged rooting.

Soil conditions for spray vehicles were good although there were some delays due to frosts.

(h) **Mid-April to mid-May**

The ear development stage (spring cereals).

Dry conditions stressed spring cereals but the deeper rooted winter cereals were able to cope.

Soil conditions again good for spray vehicles.

Grass growth was slow because of moisture stress. Herbage dry matter increased slowly up to about 22%; D values remained unusually constant at around 76; sugar levels reached a high level of 30-35% by the end of the period - probably due to the above average sunshine. First cuts of silage were moderate.

(i) **Mid-May to early June**

The stem extension stage (spring cereals).

Rain reduced moisture stress. As for the winter crop, temperatures cooler than normal caused slow development, sunshine was above normal and the net result was an increase in dry matter formation.

Grass growth was improved by the rain and led to good cuts of hay in June. After falling to about 18% (due to the rain), dry matter rose to around 25% by mid-June; sugar content fell rapidly to 18%-20% and then stayed constant until mid-June; digestibility declined steadily from the start of the period to about 62 by mid-June.

(j) **Late May to mid-July**

The grain filling stage.

Sunshine was 40-50% above normal - thus increasing dry matter production. However, temperatures were about 1°C above normal, which increased respiration losses. Temperatures were not as warm as 1976 (then about 3°C above normal) so that respiration losses were higher in that year. The grain filling stage in 1976 was probably shorter, again because of the high temperatures and these two factors explain at least partly why yields in 1976 were low.

The demand for water by cereals was about the same in 1976 as in 1984.

By the end of June SMDs reached about 120 mm and spring/winter cereals on light or shallow soils suffered from stress and reduction in dry matter accumulation (by stomatal closure).

Soil conditions were good for spray vehicles.

Dry conditions reduced grass re-growth after being grazed or cut. During July grazing became increasingly difficult.

(k) **Mid-July to end August**

Continuing generally dry weather with temperature and sunshine above normal gave good harvesting weather.

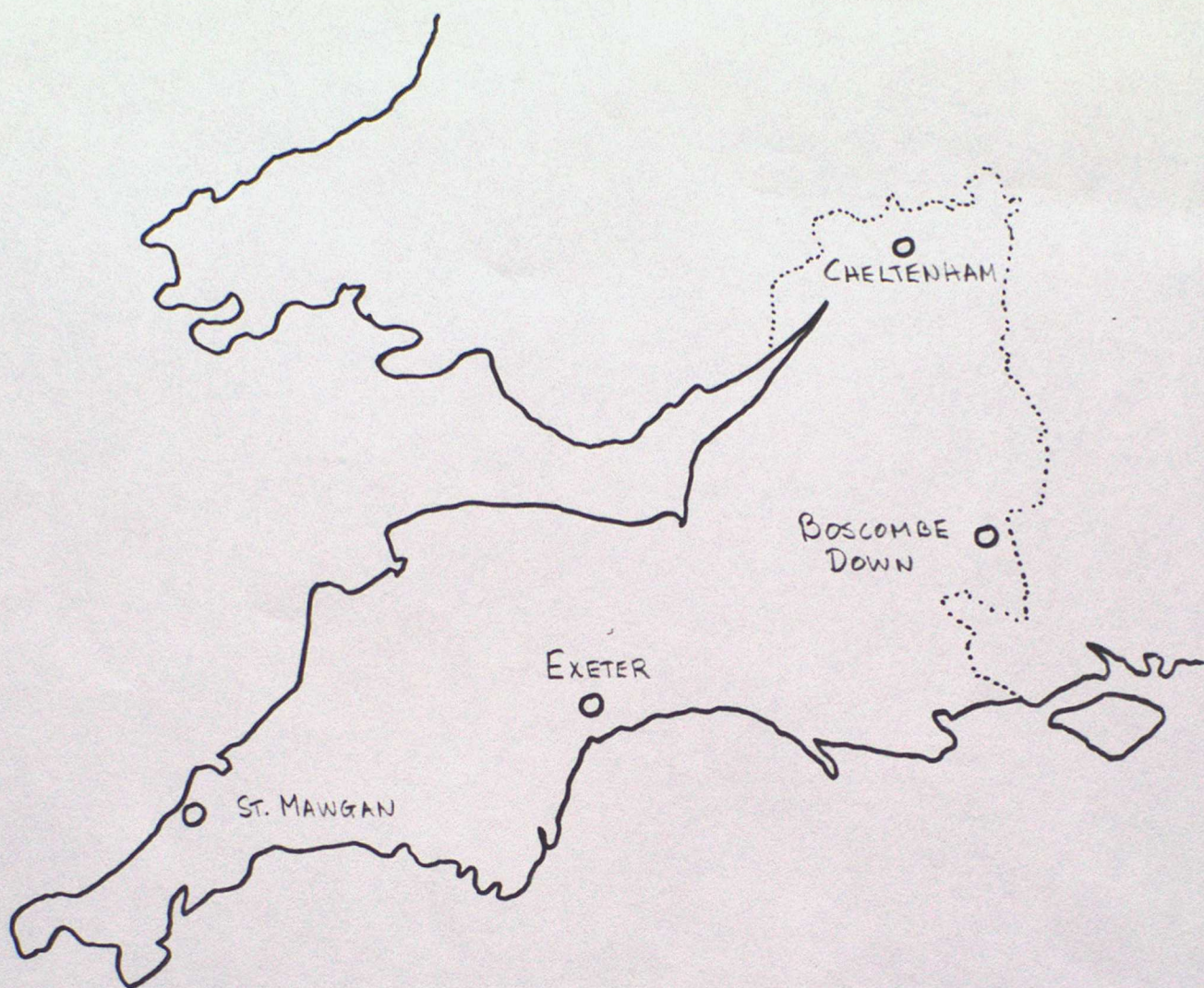
Grazing continued to be in short supply although local storms eased the stress in some areas. (Rain in September allowed grass growth and making of late silage. Soils returned to field capacity by end October/early November, some 6 to 8 weeks earlier than in 1983.)

CONCLUSION

1983/84 was a good season for crop growth. Particularly important were the periods, between April and June, of above average sunshine accompanied by temperatures around average or only slightly above. Good conditions for seedbed preparation/spraying/top dressing and harvesting must also have been important.

Agro Meteorological Department
MAFF
Burghill Road
Bristol
BS10 6NJ

December 1984

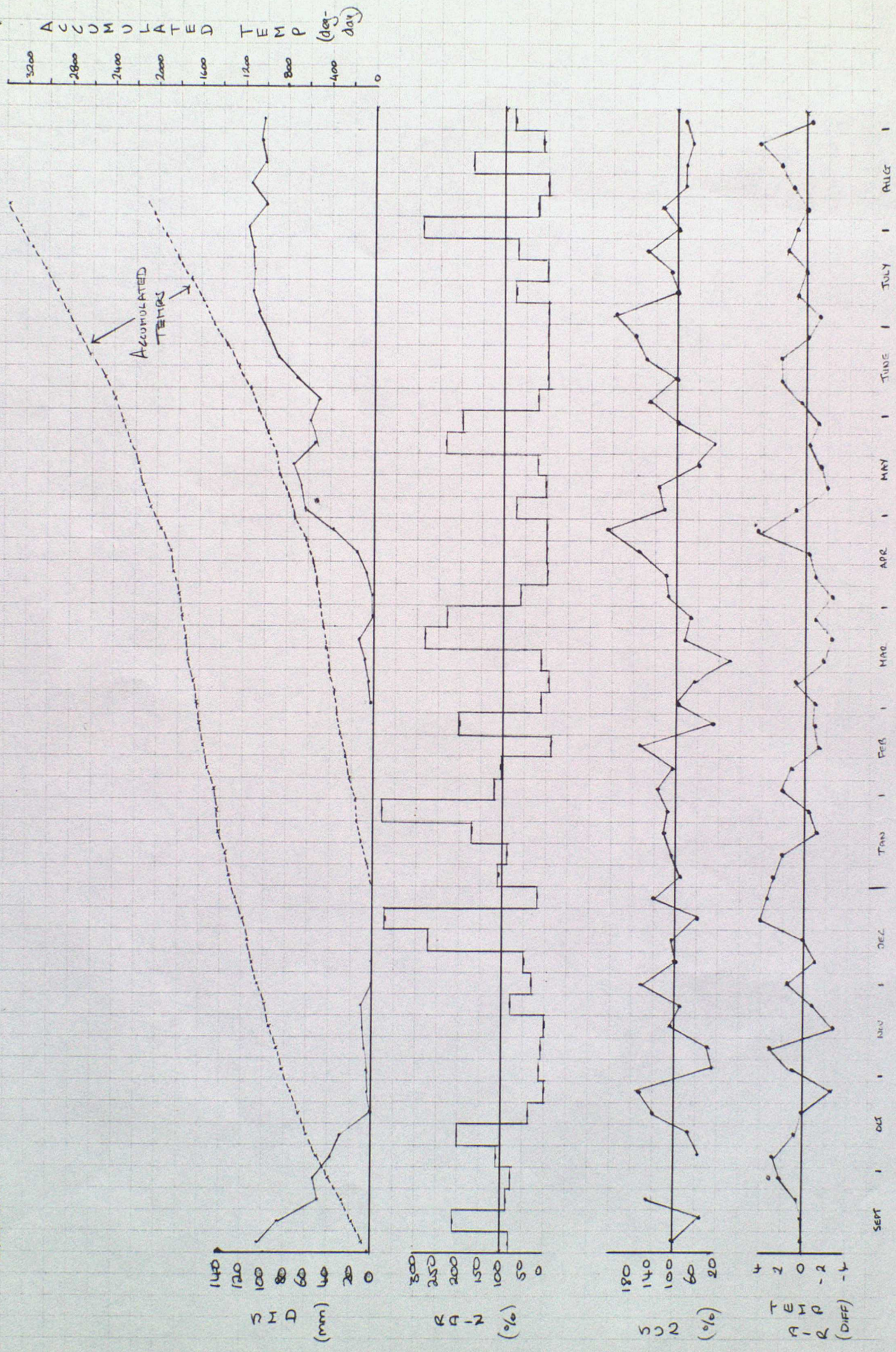


SITES USED

FIG 1

Figure 2a

EXETER



BOSCHONGE DOWN

FIGURE 2b

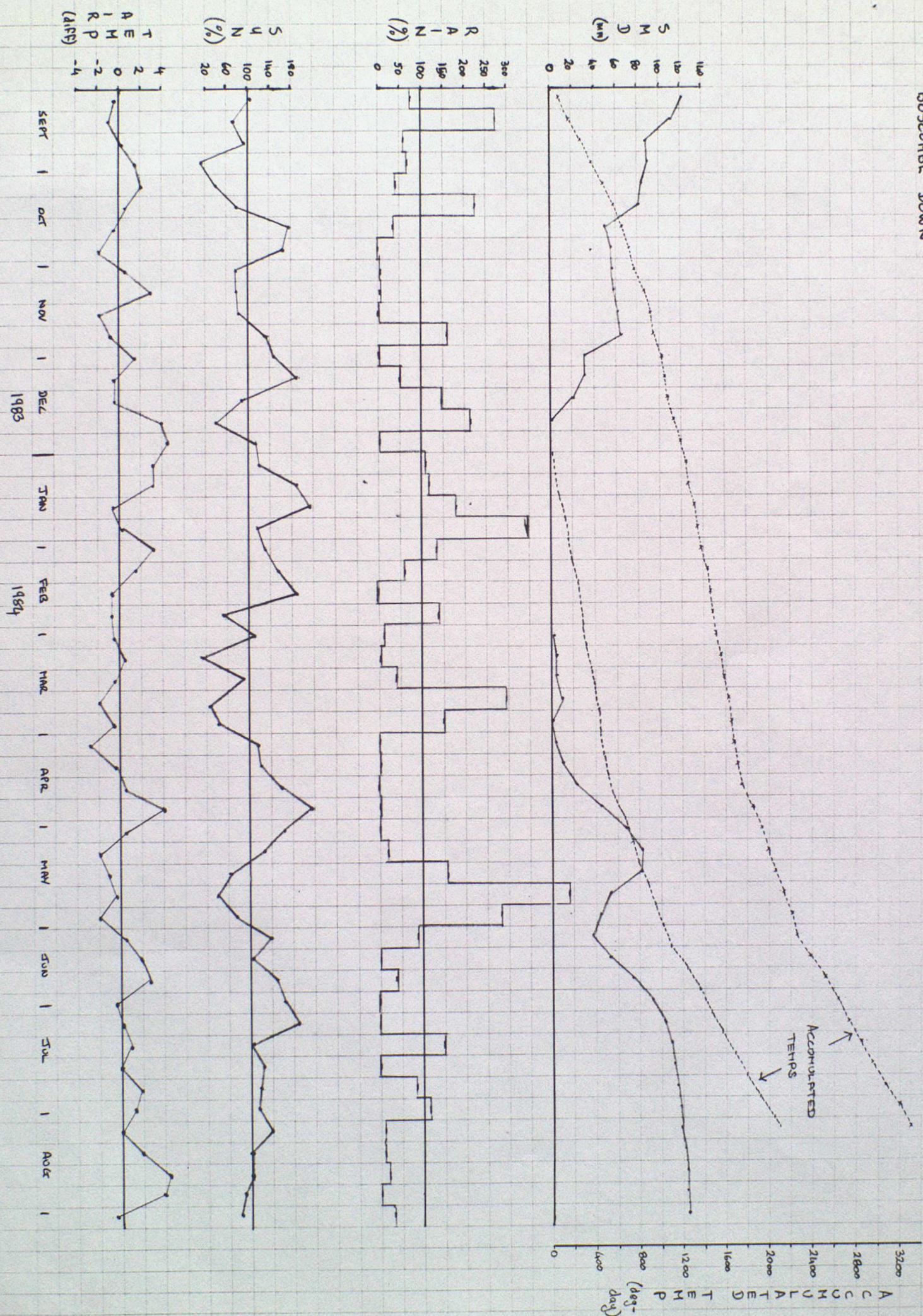
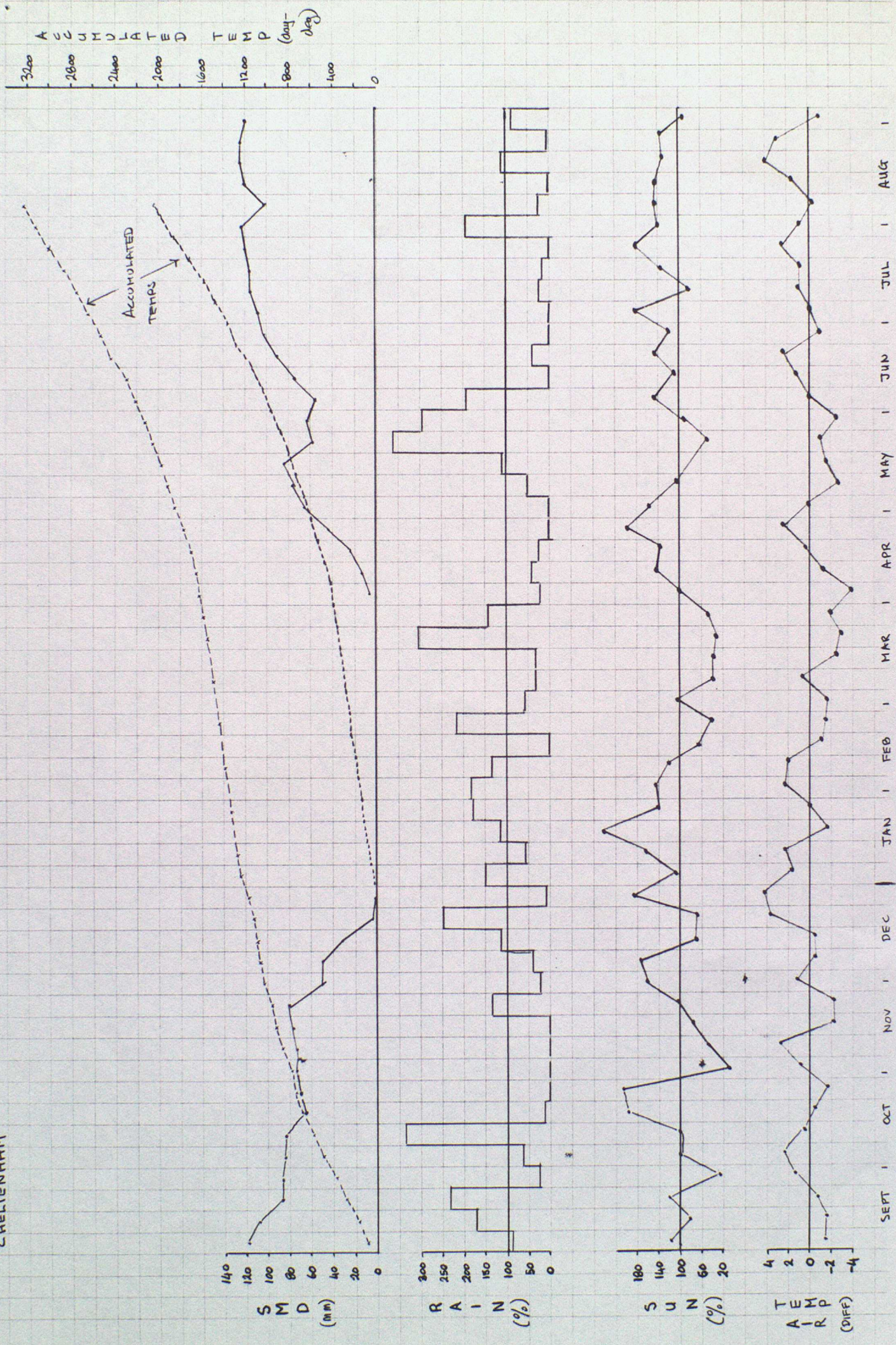


FIGURE 2C

CHELTEMHAM



ST. MAWGAN

FIGURE 2A.

